Nabil Fayoumi
11/20/2003 10:07 AM

To: sdsmit@solutia.co
cc: Sandra.Bron@epa.state.il.us, pbarrett@CH2M.com, gwvand@solutia.com, bsyare@solutia.com
Subject: RI/FS Report and NAPL/DNAPL for Sauget Area 2

Steve,

The U.S. EPA is concerned at the summary approach to RI/FS reporting presented by URS on 11/18/03. Accordingly, U.S. EPA have reviewed the RI/FS Support Sampling Plan to see if the "Total VOCs" approach to site characterization was described in the text. U.S. EPA was not able to locate such a description. U.S. EPA also reviewed the Sauget Area 2 AOC, dated November 24, 2000, for details of the AOC-required scope of work presented as Attachment B.

In summary, the SOW requires the following elements be included in the RI Report: U.S. EPA expectations regarding the scope of these topics are also included, the intent being to capture all the relevant Area 2 sites information in a single document

- Site Descriptions - U.S. EPA recommend that updated descriptions be prepared based upon our improved knowledge of conditions as opposed to simply repeating sections already presented in earlier documents. This is particularly important for the geology and hydrogeology sections; new information obtained from the RI drilling program should be incorporated here, including site cross-sections and groundwater flow maps.
- Groundwater Fate and Transport - this section should describe the factors that influence the rate of migration of groundwater contaminants through the multi-layered alluvial aquifer along the river frontage formed by Site R and Site Q.
- Previous Removal Actions - a summary of such actions is required to help provide context for the ongoing RI/FS, especially future remedial actions.
- Source, Nature, and Extent of Contamination - the AOC specifies that the *"locations of the hazardous substances, pollutants, or contaminants; the quantity, volume, size, and magnitude of the contamination; and the physical and chemical attributes of the hazardous pollutants or contaminants"* be summarized. This would require a chemical-specific analysis for each of the Area 2 sites. Consequently, resorting solely to Area-wide descriptions of *Total VOCs* or *Total SVOCs* without first providing details of the actual chemical constituents and concentrations found in the various environmental media at the six sites that constitute Area 2 is inadequate and inappropriate for an RI Report - a description and interpretation of the nature and extent of chemical constituents at each site is necessary before Area 2-wide extrapolations can be justified. This information is also required to properly evaluate remedial strategies for the various media at the various sites, or for Area 2 as a whole, should that be technically defensible.
- Analytical Data - available analytical data should be presented, and should include a description of data gaps indicated by the RI results (such as NAPL/DNAPL) - summaries of total chemical analyte groups are a useful summary tool, but a description of the occurrence and distribution of COPCs should also be presented, either here or in the above Nature and Extent section.
- Risk Assessments - summary descriptions of the HHRA and ERA processes should be presented and should include conceptual site models for the six sites in question, a description of the COCs retained for risk evaluation, and a description of the uncertainties associated with the risk assessment methodology and outcome.

The Draft RI/FS Report outline (Revision 0, date 11/14/03) provided at SA2SG's Meeting (on 11/18/03), includes most of the above sections with the exception of a data gap analysis. However, certain chapters are entitled *Streamlined* Remedial Investigation and *Streamlined* Risk Assessments and *Streamlined* Feasibility Study - what does *Streamlined* mean in the context of the Area 2 RI/FS process? The concept of a streamlined RI/FS approach is not described in either the SSP or the AOC for Area 2.

U. S. EPA is concern that the SA2SG's notion of the content and scope of the Area 2 RI/FS Report (as indicated on 11/18/03) is not in line with current U. S. EPA expectations - or, for that matter, those set forth in the 2000 AOC.

In addition, attached to this e-mail is a summary of the U. S. EPA's understanding of the NAPL/DNAPL issue at the Sauget Area 2 Site. The RI must include a determination of the presence, extent, physical and chemical properties, and mobility of NAPL/DNAPL within the landfills and within the aquifer.

During the March 7, 2002 RI/FS Project Progress Meeting, the PRP group discussed the NAPL/DNAPL issue at Area 2. It was agreed that the SA2G would use conventional screening methods to detect the presence of NAPL/DNAPL during RIFS activities. If a sufficient amount of NAPL/DNAPL was found, samples were to be collected to characterize the physical and chemical properties of NAPL/DNAPL. There are several instances where NAPL/DNAPL was observed during the RIFS field work at Sauget Area 2. However, none of the observed NAPL/DNAPL was sampled and therefore specific analytical data that characterizes the NAPL/DNAPL is not available. If you have any questions, please contact me at 312-886-6840.

DNAPLarea2.112003.do

Sincerely,

.....
Nabil Fayoumi
Remedial Project Manager
Superfund Division
U. S. EPA - Region 5
Phone: 312-886-6840
Fax: 312-886-4071
E-mail: fayoumi.nabil@epa.gov

Summary of Dense Non-aqueous Phase Liquids (DNAPL) Information at Sauget Area 2 (SA2) Sites, IL

The DNAPL issue at SA2 sites was first brought up by Steven Acree/TATTB in his review memorandum entitled "*Sauget Area 2 Superfund Site, IL, RI/FS Support Sampling Plan/Field Sampling Plan*" (dated January 2002). In general, Dr. Acree recommended that the RI sampling should include determination of the presence, extent, physical and chemical properties, and mobility of NAPL both within the landfills and within the aquifer. Accordingly, he suggested additional borings/wells be installed for all sites and the bedrock well for each site be installed in areas where DNAPL accumulations were most likely to occur, based on bedrock topography (see Figure 1 in "Discharge Control Study").

While reviewing the Draft Focused Feasibility Study (FFS) Report, Bob Root/CH2M HILL raised concern that there might be a former river channel or trough located about 3,400 feet east of the east shore of the Mississippi River. The existence of the former river channel was inferred based on the geological cross sections provided in the Discharge Control Study (Solutia, November 2001). The elevations of bedrock along this trough are less than 280 feet above mean sea level. Because of the possibility of DNAPL trapping in the former river channel, Dr. Root suggested additional investigation be conducted along this trough. Additionally, Dr. Root recommended further examination of the well construction details for four deep wells with the highest levels of total VOCs. The four deep wells, consisting of MW-3C, MW-5C, MW-7C, and MW-31C, are located 3,100 feet east of the east shore of the river and are aligned approximately parallel to the former river channel. Detailed information can be found in a technical memorandum entitled " *Sauget Area 2 FFS Review – Possible DNAPL Trapping*" (dated February 7, 2002).

Concurrently, Dr. Acree reviewed the Draft FFS report and provided comments to Mike Ribordy/USEPA RPM in a letter dated February 11, 2002. One of his comments with regard to the DNAPL issue was as follows: "*Data indicate that dense nonaqueous phase liquids may be present in the middle and deep hydrogeologic units beneath the site. The distribution of these materials may impact the effectiveness and operation of the system. If significant lateral migration of DNAPL toward the river has occurred within any of the hydrogeologic units, this source material may be present beyond the capture zone of the proposed system....It is recommended that data to estimate the potential extent of NAPL contamination be obtained during the planned RI/FS...Much of this information may be obtained from monitoring performed during installation of the proposed extraction wells and piezometers.*"

During the March 7, 2002 RI/FS Project Progress Meeting, the PRP group discussed Dr. Acree's comments on the NAPL issue at Area 2. It was agreed that the SA2G would use conventional screening methods, such as PID, FID, and Oil/Water Interface Probe, to detect the presence of NAPL during drilling. If a sufficient amount of NAPL was found during drilling, samples would be collected to characterize the physical and chemical properties of the NAPL. The SA2G agreed to address the NAPL issues in Section 3.1 of the SSP (Hydrogeology).

While reviewing the RI/FS field oversight reports, free product was observed in one boundary trench location at Site Q (BT-Q-01), one waste characterization boring at Site Q (WASTE-Q-01), and one boundary trench location at Site S (BT-S-02). In addition, free product was also observed on the water level indicator when URS took depth-to-water measurement in an alluvial aquifer well at Site Q (AA-Q-06). However, it is noticed that no DNAPL sampling was mentioned in the preliminary Field Sampling Report for Sauget Area 2 Sites Group dated June 25, 2003.

Site Q was used to dispose various wastes including drums, organic and inorganic wastes, solvents, and pesticides from 1950s to 1970s. Site S was used in the mid-1960s for waste solvent recovery practice. Similarly, Site R, a landfill operated between 1957 and 1977, was used to dispose wastes including phenols, chlorinated aromatic hydrocarbons, and other organic compounds. These historical waste disposal practices usually suggest a high probability of historical DNAPL release (see USEPA's Fact Sheet on *Estimating Potential for Occurrence of DNAPL at Superfund Sites*, 1991). On the other hand, because of the nature of the waste disposed at Site O and Site P (e.g., sludge from wastewater treatment plant and general waste), these two sites seem to have a lower probability of DNAPL releases.

In a letter entitled "*Response to Comments on Remedial Design Work Plan and Prefinal Design Groundwater Migration Control System, Sauget Area 2 Site – Groundwater Operable Unit, Sauget, Illinois"* (from Solutia to USEPA, dated March 6, 2003), it was mentioned that the grout would be mixed with a sample of DNAPL obtained from one of the boreholes installed along the wall alignment to assess the grout/groundwater compatibility.

According to the *Groundwater Migration Control System Remedial Design* (Volume 1-Attachment 4-1), dated January 21, 2003, two of five sonic borings installed in May 2002 and two of the twelve conventional soil borings were found with free product during drilling (see boring logs). The two sonic boring locations are Sonic-3 and Sonic-5, located on the barrier wall alignment. At location Sonic-3, clear NAPL was observed at about 55 feet below ground surface (bgs). At location Sonic-5, greenish-yellow free product was observed in a soil sample collected from 138 feet to 141 feet bgs. The two conventional soil borings are SB-1 and SB-2, at the locations of two extraction wells at Site R. Free product was noticed at a depth of 94 feet bgs at location SB-1. An oily sheen with a slight hydrocarbon or solvent odor was generally noticed from 30 feet bgs to the bedrock.

On May 13, 2003, Solutia submitted a "*Work Plan for DNAPL Characterization and Remediation Study, Sauget Area 1 Sites, Sauget, Illinois*" (dated 5/13/03, Revision 1) to USEPA, together with the "*Response to Comments from Laramide Environmental*" and "*Response to comments from Steven Acree, USEPA"* on the draft document dated February 28, 2003. As said in the document title, this work plan addresses the DNAPL issue at Area 1 sites only. No NAPL sampling information is currently available for Sauget Area 2 Sites.

In conclusion, there are several instances where DNAPL was observed during the RI/FS field work at Sauget Area 2. However, none of the observed NAPL was sampled and therefore specific analytical data that characterizes the NAPL is not available.